acreage set out. Pastures were excellent all the month. The prospect for fruit, especially apples, was poor.—*Edward A. Evans.*

Washington.—The rain of the month was poorly distributed. It was copious in the eastern tier of counties during the first three to five days and during the period from the 14th to the 18th, having a beneficial influence on spring wheat and vegetables. A drought prevailed in the western division until the 14th, when general rains began, lasting four days. In the west, pastures were dried up and the potato crop shortened. The oat crop was also light, owing to drought.—*G. N. Salisbury.*

West Virginia.—The weather during July was favorable for crops, but harvesting was somewhat retarded by showers. Corn made rapid growth. Wheat and rye were harvested with poor yields. Haying was in progress during the last week, but the crop was smaller than expected. Oats were promising and some were being cut. Millet, cowpeas, gardens, pastures, and buckwheat were doing well. The prospects were that apples and peaches would make about a half crop and that grapes would be abundant.—*E. C. Vose.*

Wisconsin.—Although the month was cool, all crops, except corn, made substantial advancement. Winter wheat and rye reached maturity about the middle of the month, and oats, barley, spring wheat, and rye were ready for cutting at the close. Corn made slow growth on account of cool nights. The hay crop was heavy and generally secured in good condition. Tobacco was generally backward. Apples and cranberries were in promising condition at the end of the month.—*W. M. Wilson.*

Wyoming.—Cool, with frosts on the 7th and damaging frosts on the 30th over the western sections. Good rains were quite general during the first half of the month. Range grass was mostly cured, with an excellent stand. Grain and gardens not injured by frosts made good growth. A good first crop of alfalfa was secured. Native hay harvest was in progress; good crop. Good flow in streams, and irrigation water sufficient for needs. Stock in excellent condition.—*W. S. Palmer.*

SPECIAL ARTICLES.

RECENT PAPERS BEARING ON METEOROLOGY.

Mr. H. H. KIMBALL, Librarian and Climatologist.

The subjoined titles have been selected from the contents of the periodicals and serials recently received in the Library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau. Unsigned articles are indicated by a ——.

American Journal of Science. New Haven. 4th Series. Vol. 18.

Lester, O. C. On the Oxygen Absorption Bands of the Solar Spectrum. Pp. 147–156.

Electrical World and Engineer. New York. Vol. 44.

—— Sir Oliver Lodge on Electricity. P. 164.

Collins, A. Frederick. Synthetic Wireless Telegraphy. Pp. 174–175.

—— Wildman Wireless Telegraph System. P. 184.

Proceedings of the American Philosophical Society. Philadelphia. Vol. 43.

Haupt, Lewis M. The Mississippi River Problem. Pp. 71–96.

Abbott, Charles Conrad. One Explanation of Reported Showers of Toads. Pp. 163–164.

Scientific American. New York. Vol. 91.

Willey, Day Allen. The Work of a Western Cyclone. Pp. 81–82.

Science. New York. Vol. 20.

—— Temperature of the Lower Air. [Review of article of Woeikof.] P. 154.

Geographical Journal. London. Vol. 24.

Thomson, J. P. Queensland. [Climate.] Pp. 184–187.

Knowledge. London. New Series. Vol. 1.

Marriott, William. Temperature of the Air [of Great Britain]. Pp. 167–169.

Nature. London. Vol. 70.

Lockyer, William J. S. A Probable Cause of the Yearly Variation of Magnetic Storms and Auroræ. Pp. 249–250.

—— A New Self-recording Mercurial Barometer. P. 254.

—— On the Relation between the Spectra of Sunspots and Stars. [Review of article of Norman Lockyer.] P. 261.

—— Relation of Rainfall to Run-off. Pp. 299–300.

Philosophical Transactions of the Royal Society of London. London. Vol. 203.

Chree, C. An Enquiry into the Nature of the Relationship between Sun Spot Frequency and Terrestrial Magnetism. Pp. 151–187.

Proceedings of the Royal Society. London. Vol. 74.

Shaw, W. N. On the General Circulation of the Atmosphere in Middle and Higher Latitudes. Pp. 20–30.

Lockyer, Norman. On the Relation between the Spectra of Sun Spots and Stars. Pp. 53–54.

Quarterly Journal of the Royal Meteorological Society. London. Vol. 30.

Curtis, Richard H. Water-vapour. Pp. 193–209.

Cohen, J. B. One Cause of Autumn Mists. Pp. 211–218.

—— Meteorological Observations at Wadi Halfa. [Abstract of Meteorological Report for 1901, Survey Department, Public Works Ministry, Cairo.] P. 218.

Christie, W. H. M. Reports of Observatories for 1903. Royal Observatory, Greenwich. P. 248.

Holmes, R. L. Rainfall in Fiji. P. 252.

Crabtree, W. A. Observations at Masaba, Equatorial Africa. Pp. 255–256.

Hall, Maxwell. Meteorology of Jamaica. [Extract of article of Maxwell Hall.] P. 256.

—— Deep Earth Temperatures at Harestock and Southport, 1899 1903. Pp. 256–258.

Assmann, R. Temperature of the Upper Air over Berlin. [Extract from pamphlet of Assmann.] Pp. 258–261.

—— Temperature of the Air at 6 miles above the Earth. [Review of paper of Hann.] Pp. 261–264.

Sheward, R. Weather Notes in Samuel Pepys's Diary, 1659–1669. Pp. 264–266.

Science Abstracts. London. Vol. 7.

B[orns], H. Annual Variations of Insolation. [Abstract of article of Gorcznski.] Pp. 501–502.

B[orns], H. Values of Certain Meteorological Quantities for the Sun. [Abstract of Article of F. H. Bigelow.] Pp. 502.

Symons's Meteorological Magazine. London. Vol. 39.

Raulin, V. A Three Years' Period in Rainfall. Pp. 111–112.

B., D. C. Lake Movements and Thunderstorms. P. 112.

—— The Kew Observatory. Pp. 112–113.

Dines, W. H. A new Meteorograph for Kites. Pp. 109–110.

Horner, D. W. Ball Lightning. P. 111.

Ciel et Terre. Bruxelles. 25me année.

—— Le phénomène de desséchement dans l'ancien monde. Pp. 255–264.

Annales de Géographie. Paris. 13me année.

Passerat, C La température des pôles. Pp. 289–295.

Comptes Rendus de l'Académie des Sciences. Paris. Tome 139.

Chauveau, A. B. Sur la déperdition électrique dans l'air, au sommet de la tour Eiffel, pendant l'orage du 24 juillet. Pp. 277–278.

La Nature. Paris. 32me année.

Plumandon, J. R. La sécheresse de l'air. Pp. 90–92.

Mériel, Pierre de. Le cerf-volant et les sondages aériens à la mer. Pp. 101–103.

Le Temps qu'il Fait Mons. Août, 1904.

Bracke, A. Rides de nuages. Pp. 145–154.

Himmel und Erde. Berlin. 16 Jahrgang.

Nessen, Fr. Ueber unsere Schutzmittel gegen Blitzgefahr. Pp. 433–449.

Lendenfeld, R. von. Klima und Gletscher. Pp. 450–461.

Erendt, Th. Zur Gewitterkunde in Nord- und Mitteldeutschland. Pp. 462–472.

Das Wetter. Berlin. 21 Jahrgang.

Wegener, Kurt. Aus dem Aeronautischen Observatorium. Der Aufstieg von 25. März 1904 und eine "Drachenjagd." [Height attained 5080 m.] Pp. 85–88.

Hegyfoky, J. Das Maiwetter nach Zahlenangaben. Pp. 145–148.

Kienast, Hermann. Der Gang der Lufttemperatur in Königsberg i. Pr. Pp. 148–155.

Kreuschner, Curt Rudolf. Eis und Eisberge im Atlantischen Ozean. Pp. 156–159.

Geographische Zeitschrift. Leipzig. 10 Jahrgang.

Hettner, Alfred. Das Klima Europas. Pp. 371–390.

Physikalische Zeitschrift. Leipzig. 5 Jahrgang.

Guggenheimer, Siegfr. Ueber die Ionisation bei Ozonbildung. Pp. 397–399.

Lüdeling, G. Ueber eine Vorrichtung zur Registrierung der luftelektrischen Zerstreuung Pp. 447–451.

Illustrierte Aëronautische Mitteilungen. Strassburg. 8 Jahrgang.

Elias, H. Drachenaufstiege in den Tropen. Pp. 252–253.

Hemel en Dampkring. Amsterdam. 2 Jaargang.

Nell, Chr. A. C. De Beoefening der meteorologie in Nederland. Pp. 36–43.

Meteorologische Zeitschrift. Wien. Band 21.

Kremser, V. Bericht über die zehnte Allgemeine Versammlung der Deutschen Meteorologischen Gesellschaft zu Berlin am 7–9. April 1904. Pp. 297–316.

Quervain, A. de. Ueber die Synoptischen Wolkenbeobachtungen der internationalen Kommission für wissenschaftliche Luftschiffahrt. Pp. 316–323.

—— Hann: Ueber die Temperaturabnahme mit der Höhe bis zu 10 km. nach den Ergebnissen der internationalen Ballonaufstiege. Pp. 324–326.

—— Quervain, A. de: Ueber die Hebung der Atmosphärischen Isothermen in den Schweizer Alpen und ihre Beziehung zu den Höhengrenzen. Pp. 326–328.

Müller, Karl. Einige Beobachtungen am Sonnenschein-Autographen von Campbell-Stokes. P. 328.

Drapczynski, Viktor. Berechnung der mittleren Bewölkung aus der Zahl heller und trüber Tage für Habana. Pp. 328–329.

—— Dr. Eugen von Cholnoky: Der Witterungswechsel am Medarditage. Pp. 329–330.

Mazelle, Ed. Meerestemperatur bei Pelagosa. P. 330.

—— Hann über die Temperatur an der Ostküste von Grönland, Stykkisholm gegenüber. Pp. 330–334.

Hann, J. Resultate der meteorologischen Beobachtungen zu Marakesch (Marokko) 1900 und 1901. Pp. 334–335.

—— Meteorologisches aus Südafrika. P. 336.

Ficker, Heinrich v. Temperatursturz am 4. Mai in Innsbruck. Pp. 336–338.

Margules, M. Böe vom 4. Mai 1904 in Oesterreich. Pp. 338–340.

Schwarz, L. Schneefall mit Staub auf der Schneekoppe. Pp. 340–341.

Wolfer, A. E. Walter Maunder über die "grossen" magnetischen Stürme 1875 bis 1903 und ihre Verbindung mit Sonnenflecken nach den Aufzeichnungen an dem Königlichen Observatorium in Greenwich. Pp. 341–343.

THE MOVEMENTS OF THE HIGH CLOUDS IN THE WEST INDIES.

By JOHN T. QUINN, Esq., St. Kitts, W. I., dated May 24, 1904.

There was printed on the back of the Pilot Chart of the North Atlantic for August, 1902, a valuable paper on West Indian hurricanes, in the fourth column of which, in a passage describing the normal weather conditions within the Tropics, it is stated that, "The higher clouds (cirrus, cirro-cumulus) come in general from some point between north and east, the lower clouds (cumulus, cumulo-nimbus) from a point between east and south."

Having always believed that the "return trade wind," at least from Maury's time onward, had been universally accepted as a part of the ABC of tropical meteorology, I was very much surprised by the first part of the above statement, namely, that the higher clouds come in general from some point between north and east. The evidence for the generally accepted statement, that the high clouds in the West Indies move as a rule from some westerly point, seemed to be so conclusive that it was natural to assume that the statement in the article printed on the Pilot Chart must be a slip of some sort. But as it appears again in a reprint of the paper in question on the back of the Pilot Chart of the North Atlantic for September, 1903, it is perhaps not a slip after all; but in that case it would be interesting to know where the observations on which the statement is based were made, for it does not appear to be correct for the smaller islands of the West Indies or for the stretch of ocean that lies immediately in front of them.

From the following table it will be seen that out of 58 observations only 15 showed high clouds moving from a point in the northeast quadrant, and, as will appear later, some of these can be shown to be dependent on cyclonic movements, which have caused a deviation from the usual direction. It will also be seen that after entering as belonging to the northeast quadrant the 4 observations of clouds moving from the north there are still only 15 entries in that quadrant, while there are 30 entries in the northwest quadrant. If, therefore, we were to write in the passage quoted from the Pilot Chart the words "between north and *west*," instead of the words "between north and *east*," the statement would come much nearer to the truth, so far, at least, as the smaller islands of the West Indies are concerned. Still nearer the truth would it be to say that the high clouds come from some westerly point, for we see that out of the total of 58 entries 39 are in the western semicircle, while 19 only are in the eastern semicircle, and if the 4 entries of movements from the north were divided between the two semicircles, instead of being all put in the eastern semicircle, as they are in the table, then the relation would be 41 to 17.

As bearing on this question I have collected and arranged in the following table my observations of the movements of the high clouds, as observed from one or the other of the Danish Islands of St. Croix and St. Thomas (mostly from the former), during the months from July to November last year:

Date.	Clouds.	Direction.			
		From a point in the western semicircle.		From a point in the eastern semicircle.	
		NW. quadrant.	SW. quadrant.	SE. quadrant.	NE. quadrant.
1903.					
July 19	Cirrus	wnw.			
July 30	do	w.			
Aug. 1	do			se. or se. by e.	
Aug. 2	do			se.	
Aug. 4	do				n.
Aug. 17	do				n. by e.
Aug. 18	do				n. by e.
Aug. 23	do	w.			
Aug. 25	Cirro-stratus			ese.	
	Cirrus			e. or e. by s.	
Aug. 26	do		sw. or ssw.		
Aug. 30	Cirro-stratus	w.			
Aug. 31	Cirrus				e.
Sept. 1	do		sw.		
Sept. 5	Cirro-stratus		sw.		
Sept. 6	do		sw.		
Sept. 8	do		wsw.		
Sept. 10	Cirrus		sw.		
Sept. 11	Cirro-stratus		sw. or sw. by s		
Sept. 13	Cirrus		sw.		
Sept. 14	Cirro-stratus	nnw.			
Sept. 18	do	nw.			
Sept. 20	Cirrus				e.
Sept. 25	10 a. m. do	w.			
	3 p. m. do				e.
Oct. 1	a. m. do	nw.			
	p. m. do	nw. or nnw.			
Oct. 3	do	nw. or nnw.			
Oct. 4	do	w.			
Oct. 6	do				ene.
Oct. 7	do				ne.
Oct. 8	7 a. m. do				nne.
	2:30 p. m. do				n.
Oct. 9	Cirro-stratus	nw.			
Oct. 11	Cirrus	wnw.			
Oct. 13	do	w.			
Oct. 14	a. m. Cirro-stratus	wnw.			
	p. m. Cirrus	wnw.			
Oct. 15	do	wnw.			
Oct. 20	do	w.			
Oct. 21	Cirro-cumulus		s. or s. by w.		
Oct. 23	Cirro-stratus and cirrus.	w.			
Oct. 24	do	w.			
Oct. 25	Cirrus				ene. or ne.
Oct. 27	Cirro-stratus				n.
Oct. 28	do				nne.
Nov. 2	Cirrus				nne.
Nov. 3	do				n.
Nov. 4	do	nw. or wnw.			
Nov. 5	Cirro-stratus	wnw.			
Nov. 11	do	nw.			
Nov. 13	Cirrus	wnw.			
Nov. 14	Cirro-stratus	w.			
Nov. 15	do	w.			
Nov. 19	do	wnw.			
Nov. 20	do	wnw.			
Nov. 21	Cirrus and cirro-stratus.	w.			
Nov. 22	Cirrus, cirro-stratus, and cirro-cumulus.	w. by s.			
Total		30	9	4	15

It appears, then, that the westerly directions are the normal and the easterly the exceptions; and if the conditions over the surrounding ocean at the time were known, these exceptional cases might perhaps be all explained. For two of them, embracing 5 out of the 19 observations, it does, indeed, seem highly probable that the exceptional conditions causing the movements were revealed by the movements themselves, as shall now be noted.

It may perhaps be taken for granted that the theory of the spreading of the upper air from the vortex of a cyclone is now commonly accepted, and if the facts correspond with the